

2000-148728/14	A35 E24 F06	CIBA 1998.07.08	A(3-A5A, 8-E3, 11-C4A, 12-S5Q) E(21-C10, 21-C13, 21-C16, 21-D, 21-D1, 21-D3, 22-C, 22-C1, 22-C2, 22-C3, 22-E1, 23-B, 25, 25-E1) F(3-F3, 3-F9, 3-F16A, 3-F16C, 3-F18, 3-F19, 3-F22, 3-F25, 3-F31)
CIBA SPECIALTY CHEM HOLDING INC		*DE 19930995-A1	
1998.07.08 1998-001456(+1998CH-001456) (2000.01.13)	D06P 1/18, 1/24		
Ink-jet printing on textile, especially cellulose, e.g. cotton or viscose rayon	C2000-046796		
Addnl. Data: MHEIDLE M, KOLLER S	1999.07.05 1999DE-1030995		
NOVELTY			
Ink-jet printing on textiles uses an aqueous ink containing reactive, disperse or pigment dye(s) with a viscosity of 1-40 mPa.s.			
USE			
The process is used for printing a textile web in one nuance over the entire area, especially for printing both sides at the same time; or for printing a textile with a digitalized image with a computer-controlled ink-jet printer (all claimed), including digitalized images from a video camera or scanner. It is especially useful for printing textiles containing hydroxyl groups, preferably natural and regenerated cellulose, e.g. linen, hemp, lyocell and especially viscose and cotton, or mixtures containing these. It can also be used with			
			wool, silk, polyvinyl, polyacrylonitrile, polyamide, aramid, polypropylene, polyester and polyurethane materials, including cellulose 2/2 and tri-acetate, polyethylene terephthalate or polyethylene terephthalate-co-isophthalate and condensation products of iso- or tere-phthalic acid with 1,4-bis(hydroxymethyl)-cyclohexane.
			ADVANTAGE
			Ink-jet printing is much cheaper and quicker than screen printing. The inks have good stability and viscosity. They give strongly colored prints with sharp contours and good general fastness (e.g. to acids, alkalis, water, washing, sea water, over-dyeing, perspiration, chlorine, rubbing, ironing and pleating).
			WIDER DISCLOSURE
			The reactive, disperse or pigment dyes used are known or can be prepared by methods analogous to those for known dyes, e.g. diazotization, coupling, addition and condensation reactions.
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SPECIFIC COMPOUNDS

Specific examples of the disperse dyes are 1-(2-phenylaminocarbonyloxyethyl)-2,2,4,7-tetramethyl-6-(2,2-dicyanoethyl)-1,2,3,4-tetrahydroquinoline (VII) and 3-hydroxy-2-(1,3-dioxo-indanylidene)-quinoline (VIII) of the formulae;

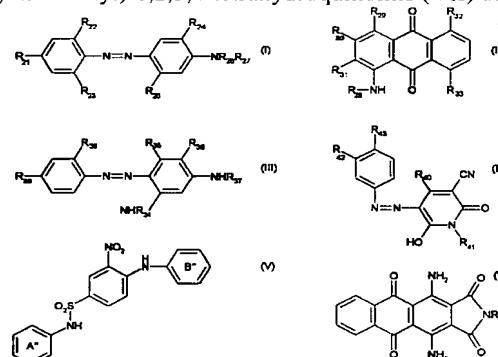
EXAMPLE

Mercerized cotton satin with padded with a liquor containing 40 g/l sodium carbonate and 100 g/l urea (70% pickup) and dried. It was then printed with a drop-on-demand piezo ink-jet head, using an ink containing 15 wt.% of the reactive dye 8-(2-N-ethyl-N-phenylamino)-4-chloro-1,3,5-triazin-6-yl-amino)-2-(2-sulfophenylazo)-1-hydroxynaphthalene-3,6-disulfonic acid, 20 wt.% 1,2-propylene glycol and 65 wt.% water. The print was dried completely and fixed for 8 minutes at 102 °C in saturated steam, then given a cold rinse and boiling wash, rinsed again and dried. The resultant print had excellent general fastness.

TECHNOLOGY FOCUS

Organic Chemistry - Preferred Disperse Dyes: The disperse dye is an azobenzene (I), aminoanthraquinone (II), 2,6-diamino-3-phenylazo-

pyridine (III), 3-phenylazo-5-cyano-2-hydroxypyrid-6-one (IV), 2-phenylamino-5-phenylaminosulfonyl-nitrobenzene (V), 1,3,5,10-tetraoxo-naphth[3,4-j]isoindole (VI) or 1-(2-phenylaminocarbonyloxyethyl)-2,2,4,7-tetramethyl-6-(2,2-dicyanoethyl)-1,2,3,4-tetrahydroquinoline (VII) of the formulae;



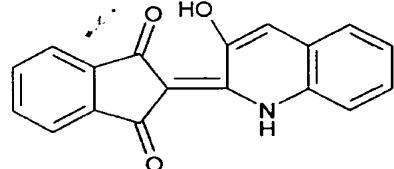
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R₂₁, R₃₈ = halogen, nitro (NO₂) or cyano (CN);
 R₂₂, R₃₉ = hydrogen (H), halogen, NO₂ or CN;
 R₂₃ = halogen or CN;
 R₂₄ = H, halogen, 1-4 carbon (C) alkyl or 1-4 C alkoxy;
 R₂₅ = H, halogen or acylamino;
 R₂₆, R₂₇ = 1-4 C alkyl, optionally substituted by hydroxyl (OH), acetoxy or phenoxy;
 R₂₈ = H, phenyl or phenylsulfoxyl, in which the phenyl ring may be substituted by 1-4 C alkyl or 1-4 C alkylsulfo;
 R₂₉ = amino or OH; R₃₀ = H or 1-4 C alkoxy;
 R₃₁ = H or -O-C₆H₅-SO₂-NH-(CH₂)₃-O-C₂H₅;
 R₃₂, R₃₃ = H, OH or NO₂;
 R₃₄ = 1-4 C (hydroxy)alkyl;
 R₃₅, R₄₀ = 1-4 C alkyl;
 R₃₆ = CN;
 R₃₇ = -(CH₂)₃-O-(CH₂)₂-O-C₆H₅;
 R₄₁ = 1-4 C alkyl, optionally substituted by 1-4 C alkoxy;
 R₄₂ = -COOCH₂CH₂OC₆H₅; and
 R₄₃ = H; or
 R₄₄ = H; and

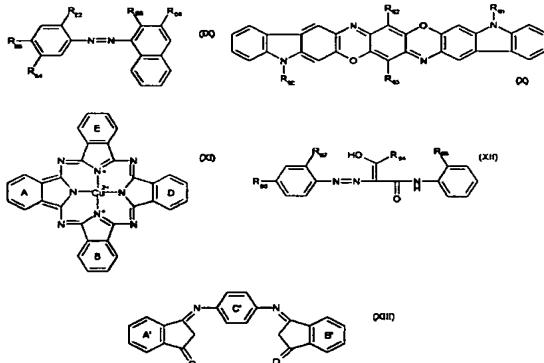
R₄₃ = -N=N-C₆H₅;
 A, B = rings optionally mono- or poly-substituted by halogen;
 R₄₄ = 1-4 C alkyl, optionally substituted by OH, 1-4 C alkoxy or 1-4 C alkoxy-(1-4 C)-alkoxy.
 Especially suitable disperse dyes are (II);
 R₂₈ = H or phenyl, optionally substituted by 1-4 C alkyl;
 R₂₉ = H or amino, optionally substituted by 1-4 C alkyl; R₃₁ = H, 1-4 C alkoxy or phenoxy;
 R₃₀, R₃₂, R₃₃ = H
); (IV);
 R₄₀, R₄₁ = 1-4 C alkyl;
 R₄₂ = H, NO₂ or halogen;
 R₄₃ = halogen);
 and 3-hydroxy-2-(1,3-dioxo-indanylidene)-quinoline of formula (VIII);

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(VIII)

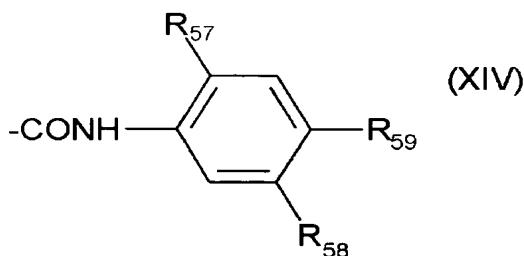
Preferred Pigment Dyes: The pigment is a 1-(phenylazo)-naphthalene (IX), carbazolo[3',2':5,6][1,4]oxazino[2,3-b]indolo[2,3-i]phenoxazine (X), copper phthalocyanine (XI), 1-arylazo-acetoacetanilide (XII) or 1,4-bis(3-oxo-indolinyl-azamethin)-benzene (XIII);



R₅₆ = hydrogen (H) or a group of formula (XIV);

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(XIV)

R₅₂, R₆₅, R₆₇ = H, halogen, 1-4 carbon (C) alkyl, 1-4 C alkoxy, nitro or cyano;

R₅₃, R₆₆ = H, halogen, nitro or cyano;

R₅₄ = H, halogen or phenylaminocarbonyl;

R₅₅ = H or hydroxyl (OH);

R₅₇ = H, 1-4 C alkyl or 1-4 C alkoxy;

R₅₈ = H, 1-4 C alkoxy or halogen;

R₅₉ = H, 1-4 C alkyl, 1-4 C alkoxy or halogen;

R₆₀, R₆₁ = 1-4 C alkyl;

R₆₂, R₆₃ = halogen;
A, B, D, E, A', B' = rings optionally mono- or poly-substituted by halogen;

R₆₄ = 1-4 C alkyl.

Preferred Ink: The ink has a total dye content of 1-35, preferably 2.5-30, more preferably 5-20 wt.% and a viscosity of 2-5, preferably 10-30 mPa.s. Preferred Process: Drying and fixing or preferably printing, drying and fixing are carried out continuously.
(40pp0016DwgNo.0/0)

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